

# Microgravity Fluids for Biology Workshop

## ASGSR Workshop III

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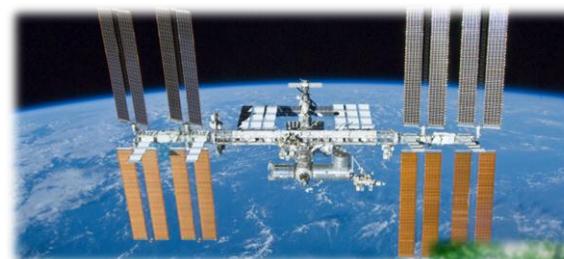
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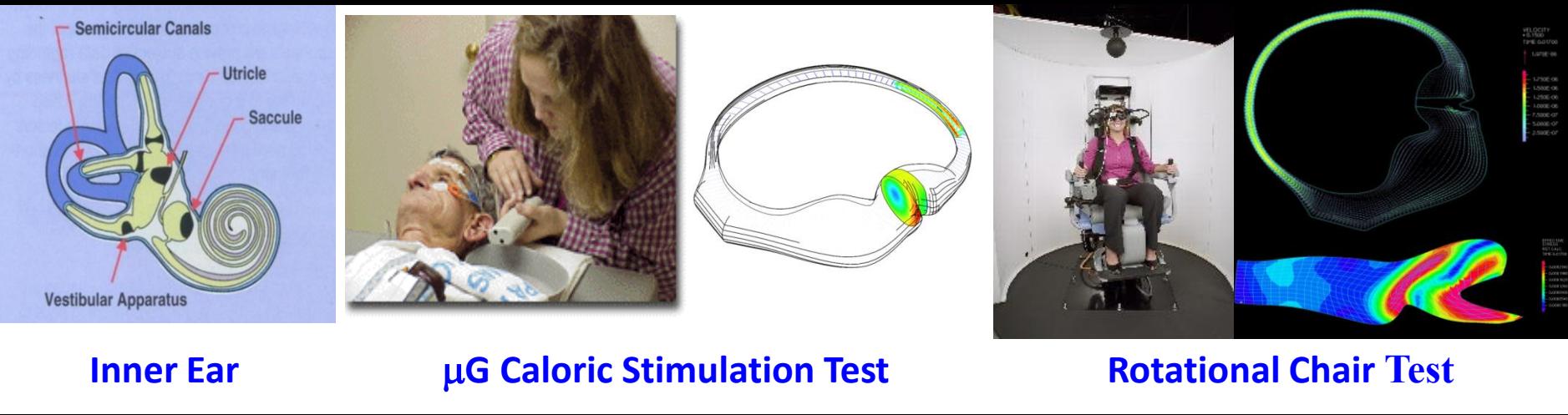


# Introduction

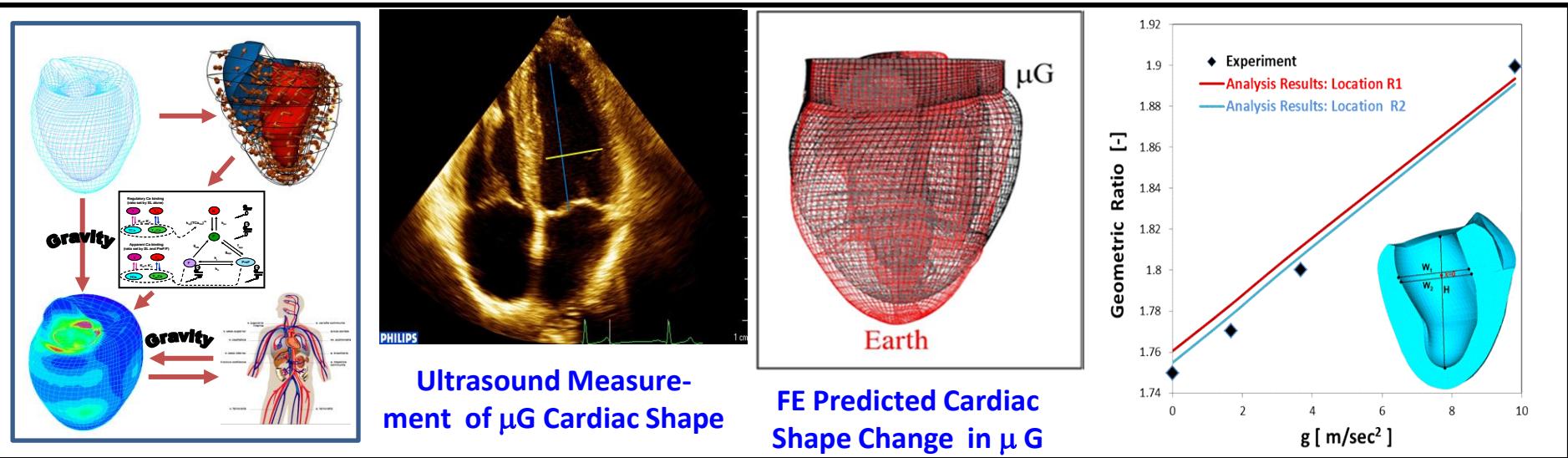
- Last year (at first ASGSR meeting) we kicked off/brainstormed ideas to foster collaboration between Fluid Physics and Space Biology.
- Developed a draft White Paper – organized to identify fluids-related knowledge/technical gaps currently facing space biology research.
- Will present overview today and invite the broader community to comment/respond.
- This is not a new concept - our goal is to reenergize both disciplines – challenge them to work together within their current budget/program limitations as well as advocate for new work if warranted.
- Fits into Open Source approach.

# Multiscale Fluid-Structural-Interaction Physiological Models

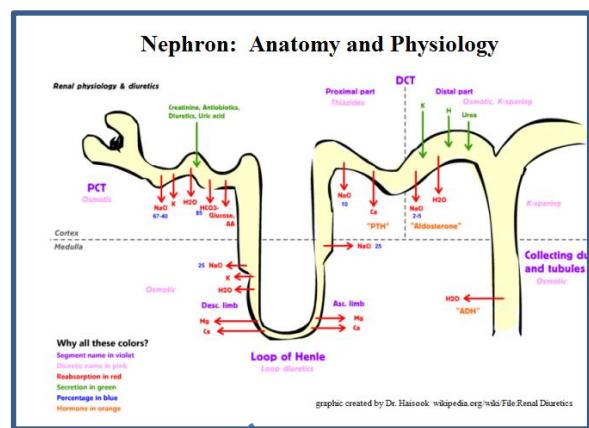
## Fluid- Structural Vestibular Model



# Integrated Multiscale Cardiovascular Model



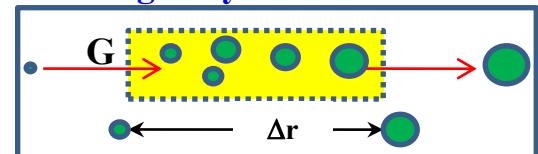
# CFD Coupled to Population Balance Model of Nephron as a Continuous Crystallizer



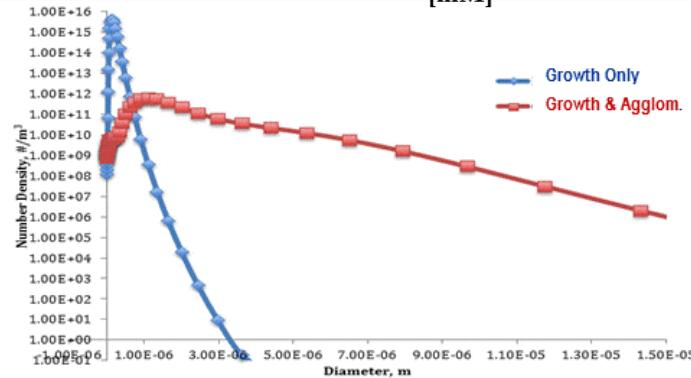
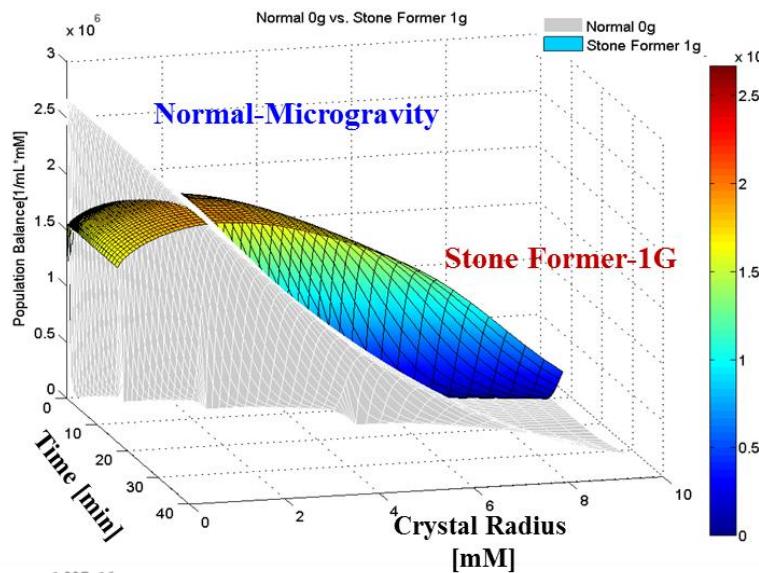
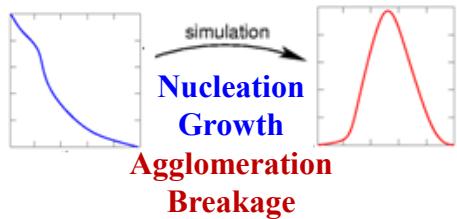
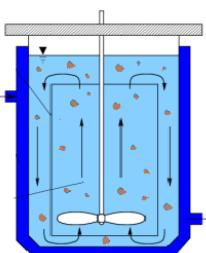
Physical Flow CV (Nephron)



Imaginary Growth CV



Continuous Crystallizing Reactor



# Next Steps

- Incorporate comments & suggestions – by November 30th.
- Prioritize risks and finalize white paper – by early next year.
- Identify areas of collaboration and match skills – on going.

**Provide to presenters today or email to:**

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***Please sign and provide email address***

# Presentations

- *Current and Future Issues for Plant Systems*

Gioia Massa & Charles Quincy, NASA KSC

- *Microgravity Fluids Issues for Animal Systems*

Jeffrey D. Smith, NASA ARC

- *Microgravity Fluids Issues for Cell Biology and Microbiology*

Jeffrey D. Smith, NASA ARC

- *Microgravity Issues for Bioregenerative Life Support Technologies*

Raymond M. Wheeler, NASA KSC